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ABSTRACT

Presented are nine short papers concerning teacher role in effecting behavioral modification in the mentally handicapped student. The paper on functional analysis of behavior discusses use of reinforcers, changing reinforcer strength, reinforcement schedules, and discriminative stimuli. A continuation paper on functional analysis of behavior explains a method of determining behavior contingencies by recording antecedent events occurring prior to behavior, behavior itself, and consequences following behavior. Developing self help skills is covered in terms of techniques to increase self feeding skills, techniques to weaken undesirable feeding behaviors and to teach appropriate toilet skills. The short discussion of behavior modification with an autistic child concludes that careful structuring of the child's environment can influence the child's behavior. A method of teaching imitation to severely handicapped and retarded children is then presented. The paper on technology of education examines use of consequences in the classroom. Three concluding short papers discuss behavior problems in the classroom, administering behavioral programs, and modification of self destructive behavior, respectively. (CB)

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INSTITUTE HIGHLIGHTS

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EFFECTING BEHAVIORAL MODIFICATION IN THE MENTALLY HANDICAPPED STUDENT:

Operant Conditioning and the Teacher's Role

Sponsored by
THE UNIVERSITY OF THE STATE OF NEW YORK
THE STATE EDUCATION DEPARTMENT
BUREAU FOR MENTALLY HANDICAPPED CHILDREN
and the
BOARD OF COOPERATIVE EDUCATIONAL SERVICES
SOLE SUPERVISORY DISTRICT, ONONDAGA AND MADISON COUNTIES

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APRIL 22 - 24, 1971
THE RANDOLPH HOUSE
SYRACUSE, NEW YORK

A Special Study Institute Funded
Under Public Law 91-230, as amended
U.S. Office of Education

NEW YORK STATE EDUCATION DEPARTMENT
BUREAU FOR MENTALLY HANDICAPPED CHILDREN

In cooperation with the

BOARD OF COOPERATIVE EDUCATIONAL SERVICES
SOLE SUPERVISORY DISTRICT OF ONONDAGA AND
MADISON COUNTIES

SUMMARIZE AN INSTITUTE

"EFFECTING BEHAVIORAL MODIFICATION IN THE MENTALLY HANDICAPPED STUDENT: OPERANT CONDITIONING AND THE TEACHER'S ROLE"

April 22-24, 1971

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This Institute was made possible through the cooperative endeavors of federal, state, and local educational agencies, as well as the conscientious investment of time and energy, and the counsel of educational personnel and others who shared responsibility with them.

The United States Office of Education and its Bureau for Education of the Handicapped, the New York State Education Department, Division for Handicapped Children, and Bureau for Mentally Handicapped Children, and the Board of Cooperative Educational Services of the Sole Supervisory District of Onondaga and Madison Counties combined resources in response to our ever-present professional concern for updating our skills as we try to meet the needs of mentally retarded children and youth.

Behavioral modification, the subject for the Institute, is one which has attracted widespread interest as a method for facilitating social, emotional, and mental growth in the retarded. A wealth of information on theory and practice swells the professional literature. Dr. Anthony Pelone, Dr. Ronald D. Ross, and Mrs. Dorothy Buehring are to be commended for their foresighted choice of this topic as a focus for our conference, and for enlisting the expertise of Dr. and Mrs. Robert Peterson to bring a burgeoning fund of knowledge to us.

Due to unforeseen personal circumstances, the Director of the Institute was unable to attend to fulfill final tasks. It is with deepest appreciation that I acknowledge the pinch-hit services of Tony Zenner, doctoral student in special education, who offered introductory remarks in my behalf.

We wish to thank the entire staff of the Randolph House, particularly Mrs. Beatrice Herz, Director of Sales, Mrs. Bette Davis, Catering Secretary, and Mrs. Mary Willoughby, Sales Secretary, for their assistance in dealing with our accommodations and fulfilling all the physical needs of the Institute.

The Francis Audiovisual Service staff were most cooperative in dealing with our special requirements and also extended themselves to rise to the occasion of the unexpected. We are grateful for their help.

The Syracuse Chamber of Commerce expressed their interest in the event by making available the secretarial services of

Mrs. Helen McMahon. We appreciate their efforts and hospitable courtesy.

Without the Planning Committee this Institute would not have come to fruition. It is to these men and women that we owe its success and the smoothness with which it functioned. They donated endless hours to planning, to organizing, and to implementing. Indeed they took every contingency in stride. The task of the Director was greatly minimized by their willingness and assistance.

The flavor and color of this three day Institute cannot be captured in its proceedings. However, the highlights have been prepared by the Petersons themselves and printed by the staff and students of the Occupational Education Center operated by our Board of Cooperative Educational Services. We are indebted in particular to Mr. John Wyatt, graphic arts teacher, and Mrs. Pearl Grandelli, commercial art teacher, for their skill and originality in preparing this attractive printed copy. Mr. Horace Braggins, Director of Occupational Education, implemented their help.

Finally, to our speakers, Dr. and Mrs. Robert Peterson, we owe a special debt of thanks. Their vital, knowledgeable presentations and illustrative materials ensured a rich experience for all who attended. The Petersons' reward surely must lie in the contribution they have made to our professional growth and the evidence, already apparent, that indeed they have enabled us to be more creative in our helping relationships with the young people with whom we work.

FOREWORD

. . . For it is not upon the physical sciences that the future will depend. It is upon us who are trying to understand and deal with interactions between human beings--who are trying to create helping relationships. So I hope that the questions I ask of myself will be of some use to you in gaining understanding and perspective as you endeavor, in your way, to facilitate growth in your relationships.--Carl R. Rogers, On Becoming a Person.

INTRODUCTORY REMARKS

Dorothy W. Buehring
Associate in Education of the Mentally Retarded
State Education Department

It is my personal pleasure to greet you as members of the team. Each of you has the singular honor of having been selected to represent a school district or a BOCES area, geographically reaching out to touch the large urban centers and the farthermost rural counties of our state. Collectively, you now become, for the duration of this Institute, the State team, truly a cross section of the educational community, because there are among us here directors, coordinators, teachers, school psychologists, and social workers. You bring to this Institute the expertise, the wisdom, the imagination, and the deep concern of the people you represent for the value of children--children, per se, but handicapped children, specifically, since this is the focus of our three-day session. This is a tribute to your professional ability and we look forward to the contribution that each of you will make to the Institute.

This morning I have the added pleasure of extending a warm and cordial welcome to the consultants of the Institute. Most apropos, first a husband and wife team and secondly, a widely recognized professional team. Dr. and Mrs. Robert Peterson--Bob and Linda. It was easy for me to call them Bob and Linda after spending the dinner hour with them and I believe that by noon each of you will be saying Bob and Linda, and they would like that. Our team leaders have immense energy, creativity, and ability, so I can assure you that we have three enriching and productive days in store.

May I also extend special greetings and sincere appreciation for their interest and active participation in this Institute to our out-of State guests, Ed Golucki and Ron Pettinato. They are on the staff at the Keystone Rehabilitation Training Center in Scranton, Pa. and will be sharing the sessions with us. We welcome also the educators, the University students,and other professional and lay people who may be joining us from time to time while we are here.

Today we open the Special Study Institute on "Effecting Behavior Modification in the Mentally Handicapped Student: Operant Conditioning and the Teacher's Role." The topic of the Institute is of the times. Never has there been a period in the history of education in our public schools when concern for human behavior has been deeper or more intense. Interest in the field is widespread. In fact, the programs in human relations have already come to be designated as education in the fourth hour. Since a child's daily living involves a variety of social interactions, we must recognize that education in the fourth hour should be a significant part of every child's experience. The basic purpose of such education is to help the child acquire insights into the forces operating in human behavior and gain emotional capacity and skill to use this knowledge.

On first thought, it would appear that such education should constitute an exceedingly important part of the child's social development. However, since the area is relatively new, and in many respects still unclear, teachers, parents, professional, and lay persons continue to question its nature and purpose. It was the recognition of this growing need for answers that prompted the planning of the Institute. Knowing that its ultimate success would depend upon the recruitment of a very special director, we turned to Dr. Edith Romano Regensburger, well recognized for her outstanding work in mental retardation, particularly in this area. Upon her acceptance, there followed months of planning and follow-up activity.

Yesterday there remained the one final task, the completion of all arrangements so that everything would be in readiness for the Institute and for your coming. It was during the lunch hour just prior to the time of our scheduled meeting that Dr. Regensburger's husband became suddenly and unexplainably ill. During the early afternoon he was taken for observation to St. Mary's Hospital where he remains under intensive care. This has been, and understandably so, a tremendous emotional shock for Dr. Regensburger, but despite this, Edith has demonstrated her usual courage, calling last night to convey her regrets to each and every one of you and to extend her best wishes for a successful Institute. This morning she has called again and I am happy to report that her husband appears to be slightly improved. They await the report of a consultation of doctors later this morning to be assured of what actually happened and the prognosis. I know that the thoughts of every one of us are with both of them at this time.

Seldom is there any real trouble, I find, or need for help that does not bring an immediate and positive response. And this is being demonstrated again this morning as I now have the pleasure of presenting to you the person who is pinch-hitting for Dr. Regensburger, Director of the Institute. I met him for the first time last evening when he came over to discuss the situation and consequently to accept this leadership role so that I might be relieved for the other responsibilities that come with the conduct of an institute. I found out little about him except that I am assured that he is a very unassuming person for he decided that the information concerning his educational background was not the important thing but rather that it was the task that remained to be done in Edith's absence. I liked that about him. During our conversation, I did however, discover a few facts, and interesting ones. His undergraduate work was done in the state of Michigan; his Master's work in the state of Tennessee; and now, his graduate work at the doctoral level in our own state, currently at Syracuse University. After a very special project during the summer, he will join the staff at the University of Southern Florida. So I am sure that you will agree with me that we are most fortunate in having this very unusual and professionally able young man with us. It is with pleasure that I now place the Institute in the very capable hands of Tony Zenner, substituting for Dr. Regensburger, Director of the Institute.

Tony Zenner
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Thank you very much. "Give me your tired, your poor, your huddled masses yearning to breathe free. The wretched refuse of your teeming shore. Send these, the homeless, tempest tossed, to me. I lift my lamp beside the golden door." It is sort of unusual that I should start with the inscription from the Statue of Liberty but unfortunately, I feel this is the only "modus operandi" of many of us in the helping professions. I want to make the point in recognizing this quote, that this Institute will not seek to change your feelings. It will seek to change your "modus operandi." This Institute will not make you less helpful, less capable of opening the golden door, less loving. It will make you more aware of behavior and, therefore, more helpful. It will make you aware of reinforcers, contingencies, aversive stimuli as a part of effecting behavioral change and, therefore, more capable of opening the golden door. It will also make you more aware of your own effectiveness as a person and, therefore, allow you more opportunity for what you all are already doing and that is, loving. In the true spirit of the behaviorist, who considers why, how, and by what route irrelevant to present existing conditions, the Petersons,Linda and Bob, are not concerned with training histories per se, or their own trained histories. Their only concern is they are here, you are here, so let's modify some behavior. Dr. Peterson's first topic is, "The Functional Analysis of Behavior."

INTRODUCTION TO THE FUNCTIONAL ANALYSIS OF BEHAVIOR

Robert F. Peterson, Ph.D.

The fact that an institute such as this one is being held suggests that none of us here today is as effective as he would like to be in dealing with the problems of the mentally handicapped. One of the reasons we are less effective than we would like to be may lie in the way in which we attempt to account for human behavior. Oftentimes our explanations for behavior have their origins inside the individual rather than outside the individual. In addition, we sometimes simply redescribe a behavior with another word and feel like we have accounted for the act observed. Consider the following example: A two year old boy is crying and generally behaving in a way we would describe as fussy. A psychologist is asked what's wrong with him. His answer, "Oh, he's just being ornery." In this case where we see a child crying and being fussy we have attached the word ornery to his behavior. Ornery, however, simply means the child is crying and being fussy. It still does not tell why the child is behaving in this fashion.

If we ask a housewife "Why do you smoke?", she may answer, "I smoke out of habit." The word habit, however, can be defined as a high frequency behavior. Redefining the word in this way and changing the answer to the question, we now see the answer, "I smoke because I smoke frequently." Obviously this does not help either. It may be more helpful if we do not try to use explanations of the sort we have just discussed and instead begin to look at the behaviors and ask the question, "How can we deal with problem behaviors?"

Thus we are led to a consideration of those conditions in the child's physical and social environment that we can influence that might have an effect on teaching him new skills or teaching him not to display inappropriate, self-defeating behaviors. One of the most important aspects of the child's environment that we can influence concerns the consequences of his behavior. Many research studies have suggested how important the consequences of one's behavior are in determining how often that behavior will be displayed. For example, most of us are used to turning a water faucet and having that response followed by water coming out of the tap. If, however, someone has turned off the water supply at some more central source, then when we turn the faucet on, no water will be forthcoming. Before very long, we are likely to stop turning the tap to obtain water and to look for another water supply. Thus, the absence of the consequence (water) has influenced the frequency with which we turn the tap. Consider also the importance of one particular kind of consequence of working--the paycheck we receive at the end of every month. While it is true that we may display many, many behaviors before we receive

our paycheck, consider what would happen if we are told the paycheck will no longer be given to us. All of us will soon stop going to work. Thus, it might be said the consequences are extremely crucial in motivating people to behave in any particular fashion.

One kind of consequence might also be called a reward. The technical term for reward is a reinforcer. A reinforcer is simply any kind of consequence that causes one to repeat a behavior at some high frequency when compared to a prior condition where the reward was not forthcoming. While we often behave to obtain certain reinforcers, we may sometimes behave to avoid others. For example, one might ask, "Where is the consequence of paying the electricity bill?" "Well," one could say, "paying the electricity bill avoids having the electricity turned off." Obviously, without the payment the electricity will not stay on.

When attempting to change a youngster's behavior using reinforcers, we must remember that a reinforcer is defined in terms of his or her behavior rather than in terms of what we think a reinforcer would be for that youngster. If we should find, for example, that a child breaks a window and is spanked, and as a result he breaks more windows, spanking would be considered a positive reinforcer for this child since it increases the behavior. On the other hand, if we were to find that a child who breaks a window and is spanked no longer breaks any more windows, then spanking would have to be termed a negative reinforcer for the child since the presentation of the negative reinforcer caused the behavior to decrease.

Some Examples of the Use of Reinforcers with Handicapped People

Some years ago, Dr. James Sherman reported a study (Sherman, 1965) where he attempted to reinstate speech in patients who had been hospitalized for extremely long periods of time in a state mental hospital and who no longer communicated verbally. Dr. Sherman selected four patients who had been mute from 16 to 45 years. The first thing he did was to ask, "How can I motivate these patients to speak? What kinds of consequences might increase verbal behaviors?" Dr. Sherman attempted to use bites of food as reinforcers for approximations to verbal behavior. The technique he used was called shaping. Thus Dr. Sherman seated the patient at a table in a small room and waited for the patient to look at him or move his head. When this occurred, he reinforced the patient by giving him a spoonful of food. Then Sherman waited for additional head movements. When head moving behavior was at high frequency, he would then wait for a movement of the lips or the mouth and follow this with a spoonful of food. Ultimately, Dr. Sherman waited until the patient coughed or passed air through his mouth. He again reinforced with food. Ultimately Sherman was able to strengthen sounds, words, and even sentences. Dr. Sherman also employed a technique of imitation, which I will not describe here, but which will be discussed in a

later presentation. Using imitation and this basic shaping technique, Dr. Sherman was able to re-establish more effective verbal behaviors in all four of the patients he tested. The patients improved considerably. Improvement ranged from being able to repeat about thirty words to complete reinstatement of speech. By beginning with a behavior unrelated to speech, such as eye contact, moving to nodding the head, then making a grunting sound, and finally to an "uh-huh" reply, Dr. Sherman was able to achieve a result that had not been produced by any other therapy applied to these patients.

Changing the Strength of a Reinforcer

Sometimes it is difficult to motivate an individual as much as one would hope to. One way of increasing the strength of a reinforcer is to see that the reinforcer is unavailable for a period of time just prior to its use as a therapeutic tool. For example, if you would like to use a particular toy as a reinforcer for certain behaviors with a young child, it may be helpful to see that the child does not have access to the toy for a period before the toy is presented as a reinforcer. Similarly, if food is used as a reinforcer, food will be more effective if the individual has not recently eaten. Thus, reinforcers can be made more effective by having them unavailable, or can be less effective if freely available. It is not uncommon for restaurant owners, for example, to give customers free access to a number of salty foods, like potato chips, peanuts, or pretzels, since eating these foods tends to make one drink more, especially since the restaurant owner is in the business of selling such drinks. Thus, giving customers salty food has the same effect as depriving one of liquid.

The Importance of Immediacy and Schedules of Reinforcement

In the beginning, when one is trying to strengthen a weak behavior, it is important to reward each occurrence of the response and to do so immediately. Once the behavior has increased in frequency it is possible to maintain this behavior by only intermittently reinforcing the response. If we are attempting to increase the frequency of cooperative play with a young child, we should initially praise him (assuming praise is a reinforcer for this child) whenever we see an instance of cooperative play. As play behavior increases, however, praise can begin to be dispensed less frequently until ultimately praise is given about as often as one would reinforce any child in this situation. The child, however, should receive at least some praise for his behavior.

Intermittent reinforcement can be applied in two ways. One way is based on the number of behaviors exhibited. This is called a ratio schedule of reinforcement. Many behaviors are maintained by ratio schedules of reinforcement. The gambler's behavior is perhaps the most obvious. When a person puts money into a slot machine the machine pays off on a ratio basis, based

on the average number of times the machine is operated. Sometimes it does not pay off at all and sometimes the machine pays off quite well. A combination lock also provides a ratio schedule of reinforcement. Three turns are required before the lock will open.

The other reinforcement schedule is called an interval schedule. Interval schedules are based on time. The importance of such schedules is attested to by the numbers of clocks that exist in the world. Clocks tell us when a response is likely to be reinforced. A response made too soon or too late may not be reinforced. If we go to the corner to wait for an 8:15 bus, and we appear at 8:20, we will have to wait for the next bus. If we go at 8:00 we will have to stand awhile. There is nothing one can do (at the moment) to produce the bus. However, if we appear at 8:14, the bus is likely to appear shortly. Thus, our walking to the bus stop is reinforced (by the appearance of the bus on an interval basis).

Discriminative Stimuli

Up to this point, we have talked about behaviors and how we might increase or decrease their frequency through the use of consequences. However, that is not the whole picture. It is also important to know something about the conditions under which one chooses to respond. For example, the child who is about to ask his father for an increase in his allowance may have learned that when father comes home from work he is likely to be a bit grumpy and tense before dinner and less likely to grant requests. However, after dinner father has had a chance to relax and is more likely to grant such requests. Thus the child will learn to ask for an increase in his allowance after dinner rather than before. In other words, a particular time becomes a discriminative stimulus for the response of asking for more allowance.

Discriminative stimuli tell us when a certain kind of consequence is likely to be forthcoming if we make a certain response. Another example may be seen in the operation of the traffic light. People cross the street when the light is green. This color indicates that it is less likely that a car will be coming in such a direction that it will strike them. On the other hand, if we cross the street when the light is red, that color tells us that it is much more likely that a car will be coming down the street in such a way that we may be hit. If someone wanted to influence the walking behaviors of a large number of people, obviously all one would have to do is to change the discriminative stimulus, the color of the light. In a similar sense, much of education is simply learning what discriminative stimuli are present and what they mean. Thus we learn to interpret the smile of the face of the poker player, the smile on the face of your wife or husband, and the frown on the face of a child rubbing his arm. All these stimuli suggest what will happen if we choose to respond in a specific way.

Frequently, one's own behavior provides discriminative stimuli for other behaviors. Thus, if I were to ask you the question, "What comes before 'Amen' in the Lord's Prayer?" you may have to pause a bit before your answer. In providing the answer most people are unable to respond immediately but must first begin to repeat silently a portion of, or even the entire, prayer before answering "ever." In other words, one response is a cue for the next response, which in turn is the discriminative stimulus for the next response, and so forth until we have the answer. Thus, discriminative stimuli may be quite subtle. For example, ask yourself what the discriminative stimulus is for putting in the clutch as you begin to approach a stop light. In this instance we depress the clutch just before the car slows to such a speed that the engine will die. But the stimulus that tells us when to do this most likely involves the speed of the car. When the car slows considerably, we disengage the clutch to avoid killing the engine. It seems safe to say discriminative stimuli are everywhere.

THE FUNCTIONAL ANALYSIS OF BEHAVIOR, PART II

Linda Peterson, R.N., M.N.

One of the implications of behavior modification is that the way in which we use ourselves can be as powerful as giving a medication and should be planned as carefully. If we reward "sick" or inappropriate behavior, that behavior is likely to increase. If we reward "well" or appropriate behavior, that behavior is likely to increase. We need to focus on the "non-pathology" and look at what the individual is doing well. Unfortunately, often we get into the habit of responding to the patient who makes the most noise. As a consequence, we reinforce the very behavior we wish to eliminate!

Some years ago I was working on a psychiatric ward. A couple of psychologists came in and asked if they might observe and record our behavior with the children. We thought we were good therapists and had no qualms about their watching our work. The psychologists, however, pointed out that whenever a child engaged in a tantrum was string jingling or generally bizarre, one of us would run over and ask him how he was feeling or try to comfort and touch him. On the other hand, when he was acting more appropriately and not engaging in these behaviors, we tended to use that time to run off to coffee! In effect, we were using ourselves differentially to reinforce the behaviors we wanted to disappear.

A second implication of behavior modification is that people are more alike than they are different, whether they might be labeled as retarded, normal, above average, or whatever. Behavioral principles seem to apply regardless of the diagnostic category or label we may give the individual. Some years ago, a study of a 45 year old normal woman with a spinal injury was reported (Fowler, Fordyce, and Berni, 1969). It was very important that she drink a large amount of water in order to ward off infections and renal calculi. The usual response of the nursing staff and physicians was to nag the patient into drinking, telling her that she was really going to get sick and could expect many infections if she did not drink. This procedure, however, did not increase her water intake. Subsequently, it was decided to have the woman record the amount of water she was drinking and keep a chart at the end of her bed where she could measure her progress. Rather than nagging, the staff decided to praise her when she drank 3,000 or more cc.'s or when she drank more water than the day before. As a result, her rate of drinking increased far above what it was previously. Thus, measurement of our behavior and its effect on others is very important to effect any treatment designed for behavioral change. Such measurements can be accomplished very simply. For example, to take frequency counts, just count the number of times a child engages in particular behavior before, during, and after the treatment. To graph frequencies one can take a sheet of paper and divide it into squares, using each square as an occurrence of a behavior.

As a result, one has an easily read bar graph of the relative frequency of the behavior over time. Taking frequency counts of behavior serves the same function that the temperature, pulse, and respiration does in assessing the physiological state of an individual.

It helps us gauge the effect of our treatment. It is important, prior to counting frequency, to define behaviors very objectively so that anyone can record and observe the same bizarre behaviors. His parents described the behavior as a "fixation." When asked, "What does he do?" they said, "Well, he's a string jingler; he does this," moving their hands up and down very quickly. This is the level we need to talk at--about what he does and what we can see, rather than categorizing the child with some general label.

Sometimes, measuring a behavior may actually help change it. Last year I visited a state hospital in Illinois and was asked to consult with the staff regarding a girl who frequently stole clothing from other girls. Prior to my consultation, I suggested that the staff record the number of objects the girl stole each day. The staff went in three times a day and recorded the number of items in the girl's closet that did not belong to her. This record was placed on the door of her room. A few days later the girl went up to the record, ripped it off the wall, and dumped it into the wastebasket. Next, it was suggested that the staff begin to record the number of days when the girl had not stolen an item. This positive record was placed on the door. After only five days of recording, the girl pulled one of the staff members to the door and said, "Look, see how good I have been." The stealing behavior decreased markedly, simply be recording when the behavior had not occurred.

Ogden Lindsley (1966) similarly reported on a problem with a young retarded boy who frequently stuck out his tongue and drooled. His family was concerned about this behavior and were considering institutionalizing him as a result. Dr. Lindsley suggested that the father record the frequency with which the child stuck out his tongue and then begin to develop a treatment procedure. A week later, the boy's father came back to Dr. Lindsley and said, "I've just had the most fantastic non-recorded success you have ever heard of. The first night I told my little boy I was going to record tongue-out-of-mouth. As I began to record, my little boy's tongue slithered up in his mouth like a night crawler and hasn't come out since." Sometimes simply specifying the behavior and recording frequency isn't enough. We need to know what is going on around the behavior--what's setting it off, and what's maintaining it.

One method of determining these contingencies might be labeled the ABC method. With this technique we record (A) the antecedent events that occur just prior to the behavior, (B) the behavior itself, and (C) the consequences that follow the behavior. This method can help you pick up tiny environmental events that might influence the behavior in question (Peterson, 1967; Bijou, Peterson, Harris, Allen, and Johnston, 1969).

Consider the example of a young adolescent who had a history of vomiting frequently for over a year. Medical tests proved there were no physiological reasons for this behavior. Hence, the patient was referred to the psychiatric unit. Following a year of counseling, there was still no change in the vomiting behavior. Subsequently, it was decided to record all of the events surrounding the problem behavior.

TIME	ANTECEDENT EVENT	CHILD BEHAVIOR	CONSEQUENT EVENT
2:00	(1) Nurse enters room.	(2) Patient reading book, looks up, smiles	(3) Nurse sits beside patient and asks if she likes the book she is reading.
	(3) Refer to column three.	(4) Patient begins retching.	(5) Nurse immediately reaches for kidney basin and holds patient's forehead to support her.
	(5) Refer to column three.	(6) Patient vomits.	(7) Nurse discusses vomiting with patient. Says she hopes patient feels better. Asks patient if she is taking any medication for vomiting.
	(7) Refer to column three.	(8) Patient replies, "no."	(9) Nurse says she will ask physician for medication order. Nurse wipes patient's forehead with cool cloth.

An analysis of this interaction into antecedents, behaviors, and consequences suggests that the staff member is playing an important role in producing vomiting behavior. As soon as the patient began to retch, the nurse reached for the kidney basin. This behavior may have set off vomiting on the part of the patient. After a discussion with the staff, the nurse no longer reached for the basin when the patient began to vomit. As a result, vomiting behavior decreased considerably. In order to test whether this simple environmental change could actually make a difference, the nurse subsequently waited until the patient began vomiting at a

later date, reached for the basin, and found that vomiting again began to increase. Obviously changing this simple response is only a tiny piece in needed therapy for this girl, who will have to learn new socialization skills and ways to "get people" positively. Sometimes finding a simple step (like changing vomiting) can open doors to other kinds of therapy.

Behavior modification involves a set ot techniques that can be more difficult to perform than is immediately apparent. It is relatively easy to understand the principles behind behavior modification procedures. However, it is more difficult to learn to administer those procedures with precision. One activity which may help illustrate the importance of reinforcing small approximations and applying reinforcement immediately after such approximations is a game called "shaping." In the shaping game the audience decides on a particular behavior to be taught. One person is selected as the "shaper" and the second person is sent out of the room. The second person then comes into the room and, through a system of feedback approximations to the selected goal, is taught the desired behavior. There are several ways to illustrate the application of consequences to behavior. One way is to say only the word "no" after each incident of inappropriate behavior and ignore all appropriate behaviors. This procedure, unfortunately, resembles the way used by most of us to deal with behavioral problems. A second procedure involves saying "yes" after each approximation to the appropriate behavior and ignoring the inappropriate behavior. The third procedure, and probably the most effective one, is to use both "yes" and "no-yes" for appropriate approximations; "no" for inappropriate responses. (The audience then participates in the shaping game.)

One should point out that some children who have been on a system where they are punished or told when they are wrong and seldom praised when they are right may behave a little strangely if they are immediately put into a system where they are praised for appropriate behavior and ignored for inappropriate behavior. This is because they have a history where ignoring means they are doing something correct. If we then put them into an environment where ignoring means you are doing something incorrect, it will take some time for the child to learn what is required.

It is often simpler to tell the person what behavior he should display such as, "Go and turn on the lights," rather than tell him, "Yes, yes, yes," every time he gets nearer and nearer to the light switch. Where instructions are appropriate, they should be used. However, even instructions will not be effective unless they are followed by a reinforcing consequence. We cannot escape the importance of providing feedback. We will elaborate on the further application of these principles and techniques in subsequent discussions.

DEVELOPING SELF-HELP SKILLS

Linda Peterson, R.N.,M.N.

The lack of appropriate self-help skills is one of the deficits that marks the severely handicapped child. The development of self-help skills not only allows the child to be less dependent on others for his well being, but can contribute toward his own image of himself as well as the label that other people may place on him. The goal in training the child in appropriate self-help skills is to help him become more like a normal child.

Techniques to Increase Self-Feeding Skills

Self-feeding is perhaps one of the most basic of the self-help skills. While many retarded youngsters are able to finger-feed, they can often benefit from techniques that have been developed to teach the appropriate use of a spoon and other utensils. The first step in training for self-feeding is to observe and record the frequency of the child's spoon-feeding behaviors in the absence of the therapist's intervention. Next, one must delineate the behaviors to be strengthened and those to be weakened. The former might include looking at the spoon, reaching for the spoon, grasping the spoon, and bringing the spoon to the mouth. Behaviors that may need to be eliminated might involve throwing the spoon on the floor, fingering the food, or bringing the bowl of food to the mouth with both hands. Shaping is a procedure which involves identifying the terminal desired behavior, delineating the small steps a child needs to achieve that end, and reinforcing successive approximations toward that goal. For example, one might reward a child for merely looking at the spoon; next, one would wait until the child not only looked but reached for the spoon before rewarding him. More advanced behavior would be required until the child not only looked at and reached for, but grasped the spoon before food would be forthcoming.

Ann, a fourteen year old retarded girl was observed for several days on a busy ward unit. She lacked correct spoon feeding responses. Subsequently, she was moved to a private room to minimize distractions, and the shaping procedure outlined above was applied. In addition, food was withdrawn for any inappropriate behaviors. The therapist simply removed the bowl and spoon, turned herself away from Ann, and counted silently to ten. The food and spoon were then re-presented matter-of-factly. Any appropriate reaching or grasping responses were warmly reinforced with "good girl," and the food. Within ten sessions this girl was observed to use the spoon, to deliver eighty-two bites of food to her mouth, in contrast to zero bites observed earlier.

Fading is another technique which can be used to teach self-feeding skills. Fading involves going through a desired activity with the child and gradually withdrawing therapist

assistance in the behavior. In teaching a child spoonfeeding, fading techniques involve placing the child's hand over the spoon, the therapist's hand over the child's hand. As soon as the therapist observes that the child can grasp the spoon independently, the therapist moves her hand to the child's wrist. As soon as the child is pulling on the spoon, the therapist moves her hand to the child's elbow, and ultimately just barely touches the child's arm until the child is feeding independently. Recently I have been using this technique with young mongoloid infants (eight to ten months) placed in an infant seat. By one year of age many of the babies are happily feeding themselves.

It is sometimes difficult, however, for the youngster to dip the spoon into the bowl to fill it with food. In a recent study (Cohen. Peterson, and Peterson, 1968), we found it very helpful to use a fading procedure to teach a four year old blind child the dipping response. This was done by placing the child in a chair with two books placed under her right elbow in such a way that the spoon would dangle in the bowl. With the elbow placed in this elevated position the child automatically dipped and filled the spoon with food. Subsequently the books were faded out one at a tire and the dipping behavior remained strong.

The Premack Principle is often necessary to get a child to eat certain foods that he may not prefer. This technique is based on the principle that one can use a high frequency behavior to reinforce a low frequency behavior. For example, if crackers are a preferred food and the child helps himself to bites of crackers, one could use a piece of cracker as a good reinforcer for a food that the child does not like. If our goal were to get a child to eat vegetables, one could wait until the child had eaten a small amount of vegetable and then allow the child a bit, but only a bite, of the preferred food (crackers). Later another bite of vegetables, followed by another piece of cracker would be offered as the child begins to eat.

Rocky was a four year old who refused all protein foods but devoured cookies, bread, and crackers. In addition, he would dawdle at mealtime and scream obscenities at his mother and siblings. Treatment was planned at mealtime with mother and four children present. Mother presented Rocky with a bowl of stew, which he refused to eat. Crackers which he liked were available from a large plate at the center of the table. Rocky looked at me and said, "Hey you, I'm going to throw my soup at you!" At this point, I took a bite of my stew, withdrew eye contact, and said nothing (except a silent prayer that he wouldn't!). When ignored, Rocky moved to grab a handful of crackers. I turned to him, removed the crackers from his hand, and said, "Rocky, let's play a game. You take a bite of stew and I'll give you a piece of cracker." For several minutes he screamed and cried, which I ignored by silently eating my meal. Then out of the corner of my eye I noted that he was looking at his spoon. Immediately I said, "That's right. I knew you

could do it." After about three minutes he picked up the spoon, took a small sip of broth, and was immediately given a piece of cracker. Shortly thereafter the sequence of events quickened and all the stew was eaten. The mother said this was the first time he had done so. After one session of eating with the family the mother imitated my behavior with Rocky. In addition, the older siblings used the same procedure when mother was absent. At present Rocky is eating a wide variety of food appropriately.

It has become evident that as one works with parents (or child case workers) in teaching feeding skills to children, the teachers must give much attention to reinforcing the parent for approximations toward dealing appropriately with their children. The sequence frequently follows the following pattern:

(1) Therapist cues or demonstrates for the parent.

(2) Parent reinforces appropriate, ignores inappropriate child behavior.

(3) Therapist reinforces (or gives corrective feedback) to the parent.

(4) The child's appropriate changed behavior maintains the parent's newly acquired responses.

Techniques to Weaken Undesirable Feeding Behaviors

Some children may refuse to eat at all. In such cases, it may be helpful to look for other reinforcers in the child's environment which could be paired with food in order to increase the power of food. As an example, a three year old child who was hospitalized with a broken leg was noted to refuse to eat all foods. In this case, the child's tray was simply not presented at the usual meal period. Instead the therapist looked for other reinforcers and noted that the child appeared to prefer a small stuffed dog which he kept by his side. The procedure in this case involved reinstating feeding behavior by going through the motions of feeding the toy dog. As soon as the little boy was noted to smile at his "doggie," the therapist gave the boy a small bite of food, tickled him with the doggie, and said he was a good boy.

Some years ago, Ayllon and Michael (1959) reported a study which involved two hospitalized adults who refused to feed themselves even though they were apparently capable of doing so. The authors noted that these women tended to be quite neat and well dressed and spent some time caring for their clothing. He suggested to the staff that at the next meal the staff "accidentally" spill a drop of food on the patient's clothing.

As a result Ayllon and Michael reported that the patients asked to feed themselves. This is an example of presenting an aversive stimulus which the patient attempts to avoid by engaging in an appropriate incompatible behavior (feeding herself).

Some children may have a certain amount of fear with regard to the feeding situation. In such cases one may use a desensitization technique. This was the case of a twelve year old retarded boy who would scream and kick his feet in response to the presentation of a spoon but behaved appropriately when required to finger-feed or use a fork. Discussions with the child's mother revealed that the spoon had been used by the mother to punish the child for behaviors the mother disliked. In order to reestablish the child's use of the spoon, the child was taken to a small room. He was allowed to finger-feed or use a fork to eat. The spoon was placed at the far end of the table. During successive meals the spoon was moved closer and closer to the child. At the end of two weeks the spoon was placed in a dish of ice-cream and presented to the child. At that point he picked up and used the spoon. He demonstrated no emotional behavior.

Some children tend to dawdle and take an extremely long time to finish their meals. In this case it may help to place a small kitchen timer in front of the child, set it somewhere between ten and thirty minutes, and remove all food when the bell rings. While the child may not get to eat all the food on his plate the first few times, most children (even severely retarded children) quickly learn to eat the food within the allotted time before the bell goes off. Whenever such a mildly aversive procedure is used, it is important to pair much social reinforcement for eating and refrain from nagging the dawdler!

Teaching Appropriate Toilet Skills

There are several ways in which one might teach a child to use the toilet appropriately. The first technique involves the application of reinforcement for the appropriate response from the child. In this case the child might be taken to the toilet every hour, seated on it for a short period of time (five to ten minutes) and rewarded for appropriate responses when he urinates or defecates. It is helpful to keep the reinforcers in the bathroom, where they can be given immediately. In addition, keep a chart in the bathroom because it provides a record so that one can soon put the child on the toilet according to his physiological schedule and maximize his success.

As a variation on this procedure, Giles and Wolf (1966) attempted to toilet train retarded adults who, despite their chronological age (young adults), had never been toilet trained. In order to make the bathroom a pleasant, rewarding situation for these patients, the patients were fed portions of their meals while sitting on the toilet. Subsequently, the patients were given laxatives the night before and suppositories to help elicit

a toileting response. At this point the patients were fed contingent upon defecating or urinating in the toilet. It should be pointed out, however, that when using suppositories to elicit the toileting response, the suppositories need to be gradually faded out. For example, the mother of an eight year old child used this technique successfully for a three week period, but then discovered that the whole program fell apart. Her child was no longer going to the bathroom in the toilet. The mother stated that she still had the reinforcers in the bathroom but when asked about the suppositories, mentioned that she had run out of them. Thus, she had gone from complete elicitation of the behavior to no elicitation of the behavior. Toileting behavior was re-established when she bought more suppositories, gave them for one week, then began to fade out the suppositories by cutting them in half, then in even smaller amounts. Ultimately she was encouraged to attempt to condition the defecation responses to another stimulus in the bathroom at the same time the suppository was inserted. She turned on the water faucet as the child began to defecate. Soon this stimulus alone "set off" the defecation response.

The third technique for toilet training involves the use of buzzer pants (Van Wagenon and Murdock, 1966). One version of this device may be obtained from Baby Research, 2305 Dewitt, Mattoon, Illinois at a cost of $7.50. Buzzer pants provide a helpful signal to both mother and child. The back of the pants contains a small speaker and battery which operate in such a way that anytime the pants become wet, a circuit is completed and a tone sounds. We have found it helpful in using the pants to let the child activate the buzzer with a wet wash cloth so that the noise will not frighten him when it is activated by his own urination response. When the buzzer sounds, the mother (or worker) should come to the child, disconnect the buzzer, calmly take him to the toilet, and have him complete the response. If the child successfully expresses even a drop of urine in the toilet, he should then be reinforced with praise and a tangible "goodie." In most cases rapid training is achieved. The child learns to associate a full bladder with the buzzer and soon "beats the buzzer" by taking himself to the toilet. Similarly, Mom becomes aware of his physiological pattern and "beats the buzzer" by placing him on it at times when success is optimal. Research in the use of buzzer pants has demonstrated that they are most effective when they are combined with reinforcement.

A final method which has been reported by Azrin and Fox at Anna State Hospital, involves training profoundly retarded patients with a combination of techniques previously discussed. With the Azrin and Fox system, the toilet was constructed such that whenever matter passes into the toilet a sound begins. In addition, the patients were "primed" to make the response often. That is, every thirty minutes they were given fluids of one sort or another so that they were very likely to make toileting responses. Patients were placed on the toilet for twenty to thirty

minutes and given edibles and social reinforcement when dry. Praise (touch) was given following appropriate responses in the toilet. When accidents occurred, residents were required to clean themselves up, take a shower, and re-dress. If the resident had soiled an area where he was sitting, his chair was taken away and the resident had to stand or sit for thirty minutes before the chair was returned.

In summary, the program involves (1) priming the toileting responses with increased fluid intake; (2) frequently reinforcing appropriate toileting responses with food; and (3) providing both feedback from buzzer pants and the tone device in the toilet. In addition, negative social consequences, such as shaking of the patient by the staff member, and the response costs of having to shower, re-dress, and stand for a period of time decrease inappropriate behaviors. Thus far the results have been impressive. Individuals had been trained in a matter of a few days using this technique.

It should be pointed out that patients trained in the Azrin program are "learning toileting" for a whole eight hour shift. Full attention is given to mastering this skill before the patient resumes his other ward activities. Further details on the program will soon be published in the Journal of Applied Behavior Analysis.

BEHAVIOR MODIFICATION WITH AN AUTISTIC CHILD

Robert F. Peterson, Ph.D.

In considering the problems of the autistic child, we should first discuss the meaning of the word autistic. There appears to be some controversy over the precise definition of this term. Some authorities feel the term autistic describes a specific syndrome, while others believe the word is used loosely to characterize children with extremely bizarre behavior. Typically, such children seem different at a rather early age. They are withdrawn, lack social skills and interest in other people, and oftentimes become very disturbed at slight changes in their environment. Usually, these children do not develop appropriate speech, or if speech does develop, it may be echolalic.

Unfortunately, a diagnosis of autism does not immediately tell how to treat the child in question. In the past autistic children have been given traditional psychiatric treatment. One of the pioneers in this field, Dr. Leo Kanner (1949), has gone so far as to suggest that autistic children who receive psychiatric treatment oftentimes do not do as well as those children who do not receive any treatment at all. Thus, it is obvious that we need to examine our treatment procedures very carefully. In the last few years, a number of psychologists and psychiatrists have begun to explore the use of behavioral procedures in treating the autistic child (Ferster and Demeyer, 1962; Wolf, Risley, and Mees, 1964; Lovaas, Berberich, Perloff, and Schaeffer, 1966). These investigators have attempted to decrease the child's tantrum behaviors, increase self-help skills, social skills, verbal and academic behaviors.

As an example of this type of treatment, let us consider a study by Brawley, Harris, Allen, Fleming, and Peterson (1969), who attempted to decrease certain inappropriate behaviors and increase desirable behaviors displayed by an autistic child. The child in this study was seven years old and was a day care patient in a children's psychiatric hospital. He had been diagnosed autistic at the age of two and entered the hospital at the age of five. He was one of eight children. The other children apparently were normal. Steve, however, did not seem to relate socially to his parents, was very difficult to manage at home, and refused to follow instructions or directions. In addition, he rarely used speech and when he did speak, his verbal utterances were echolalic. Steve played with toys infrequently and when he did play his behavior was inappropriate. Sometimes he would display bizarre behavior, such as licking the wall, spitting, and striking himself about the face or head.

The basic therapeutic tool in this study was adult attention. Attention, however, was occasionally followed with a small bit of food, such as a sip of milk, a piece of cracker,

or a potato chip. Using such tools we attempted to increase the child's appropriate verbalization, his play behavior, use of materials, and the frequency with which he would follow instructions. We also wanted to decrease self-hitting behaviors, inappropriate or unintelligible verbalization, tantrums, and withdrawn behavior.

The first step in the study was to define the behaviors to be modified, and secondly, to assess whether or not attention and small bits of food would motivate this youngster to change his behavior. We noted, for example, that Steve appeared to be very interested when the teacher sang with him and would on occasion attempt to imitate some of her words. This suggested that her attention might be a strong reinforcer.

The training sessions were broken up into two components, one devoted to language and reading skills, the other to gross motor skills. Steve was taught to name objects, pictures, colors, and shapes and to sort them into appropriate piles. He was taught when it was appropriate and when it was not appropriate to imitate behaviors. Specific procedures for teaching these skills may be found in Brawley et al. (1969). Steve also learned to hop, skip, jump, throw a ball, walk a balance beam, turn somersaults, use finger paints, crayons, and various other materials. The teacher typically would assist him in performing the response and then begin to fade out her participation and assistance until he could respond independently. In addition, natural reinforcers were used to produce appropriate behaviors whenever possible. For example, when Steve wished to go outside and was standing near the door, she would require him to say the word door or open the door, or an approximation thereof, before allowing him to go outside. If he wanted to turn the water on, some appropriate verbal response was required before the water would be turned on.

When Steve engaged in inappropriate behavior, the teacher put her head down on her arms and did not attend to him for a period of about ten seconds. After the inappropriate behavior had subsided, she would resume whatever task the child and teacher were engaged in before the beginning of the inappropriate behavior.

Throughout the study, observers recorded the amount of inappropriate and appropriate behavior displayed by the child as well as the attention given to him by the teacher and other members of the staff. These observations revealed that prior to the formal treatment period, inappropriate behaviors received a great deal more attention from the staff than did Steve's appropriate behaviors. This relationship, however, was reversed when treatment began. As a result the level of inappropriate behaviors (which formerly had been very high) had declined sharply. In addition, the level of appropriate behaviors increased markedly. Somewhat later, the teacher attempted to test whether or not the change in these behaviors might be due to the attention given them in the treatment sessions or some other environmental event. For a brief period she attended to

certain inappropriate behaviors and reduced the amount of attention given to appropriate behaviors. Under these conditions appropriate behaviors dropped sharply. Then attention was given to desirable responses only. As a result they rose to their former level. These results suggest that the kind of behavior that the therapist attends to will be most frequently displayed by the child.

In order to generalize the treatment effects as much as possible, other staff members were also trained in behavioral procedures. This training included the occupational therapist, the nurse, and the psychiatric resident, as well as the child's mother.

After a three month period Steve was discharged from the psychiatric hospital to a special class for disturbed children. After he was in the class for several months, observers were sent into the classroom to measure the level of his behavior. These observations indicated that the level of appropriate behavior was about the same as when Steve was discharged from the hospital. Inappropriate behaviors remained low.

In conclusion, it seems apparent that careful structuring of the child's environment with special attention to social contingencies (attention given to the child for particular kinds of behaviors) can markedly affect the kind and amount of behavior displayed by the autistic child. Studies such as this one, as well as the pioneering studies mentioned earlier, leave us with the hope that while it may not be possible at the moment to provide a complete cure for the problems of the autistic child, one certainly can modify and improve his behavior.

DEVELOPING IMITATIVE AND VERBAL SKILLS

Robert F. Peterson, Ph.D.

The term imitation has been used by psychologists and other educators for a number of years to explain almost any instance where the behavior of one person resembles the behavior of another. Until recently, however, imitation has not been considered one of the basic therapeutic procedures which might be employed to increase the skills of the handicapped child. Beginning in the 1960's several investigators, such as Bandura (1962); Metz (1965); Lovaas (1967); and Baer, Peterson, and Sherman (1967), began to explore the use of imitation as a therapeutic technique. One of the reasons why imitation is important as a therapeutic technique is that people often learn a new behavior in one of two ways. The first way involves trial and error behavior. Children may perform a variety of responses until one response produces the solution to the problem. For example, if you are interested in opening a door and it has a peculiar latch on it, you can manipulate the latch in a variety of ways until ultimately the door opens. The second method of learning involves the observation of a model. In this case, one simply observes how the model turns the latch and then duplicates that behavior. In this instance, we might say the observer is imitating the model. Imitation allows the observer to short circuit the long trial and error procedure in the former example. Thus, the development of an imitative repertoire places any youngster at an advantage in that he can stand upon the behaviors of others and acquire new skills at a rapid rate.

A Method of Teaching Imitation to Severely Handicapped and Retarded Children.

The following technique was used in the study by Baer et al. (1967) and is basically similar to techniques used in other studies. However, the first question one must ask is how to motivate the child to respond. In this particular study, food was chosen as a potential reinforcer. The child was given small bits of food (part of his regular meal) contingent upon the performance of certain responses. The child was seated in a chair opposite the therapist, next to a small table. The therapist said, "Susie, do this," and then performed a simple motor response, such as putting his hand on top of his head. Since the child performed no response in imitation, the therapist reached over, took the child's hand, placed it on her head, told her she was good, and gave her a spoonful of food. This procedure was repeated several times. During each repetition, however, the therapist began to assist the child less and less with her performance. Soon the therapist was simply pushing the child's hand up toward her head, while continuing to reinforce her. Ultimately, the therapist performed his demonstration, and she placed her hand on top of her head in imitation. After the first response had been learned a second motor response was demonstrated. (A list of such behaviors may be found

in Baer et al., 1967.) The same procedures were used, so that the child was given some assistance, which was subsequently reduced to zero. Next, both newly learned responses were practiced many times. Subsequently, a third response was taught. When the third response was learned, all behaviors were again practiced. Other behaviors were then demonstrated and taught. Eventually, the child began to imitate new responses on which she had received no specific training. Training continued until it was possible for the child to imitate almost any simple motor response the first time it was demonstrated by the therapist. In order to develop this level of imitative skill, each child was seen from two to six times per week with each session lasting twenty to forty-five minutes. Obviously, even with good reinforcers considerable training was required.

It should be emphasized that reinforcement is crucial to the development of imitative behaviors in handicapped children. In the study by Baer et al. (1967), reinforcement at one point was delayed some twenty to thirty seconds after each response. Under this condition the children tended to imitate far less and ultimately perform no responses at all. When reinforcement again immediately followed imitations, the children readily performed any response demonstrated to them.

The fact that the children in this study did develop a complex repertoire of motor imitations is no guarantee, however, that a child will develop verbal imitation. In the study I have just described we attempted to test whether or not a child who had developed motor imitations would imitate speech. Our initial tests showed that the child would not imitate sounds. However, when speech sounds were paired with motor imitations, the child did attempt to imitate. By having the child imitate a motor response, such as walking to the center of the room, and then a sound, such as "ah," it was possible to quickly move from motor to vocal imitations. Subsequently, the motor component of this demonstration was faded out by not walking quite as far into the center of the room. On the next trial the model walked only a few steps and said "ah." It was then possible to just sit near the child and say, "Susie, do this. Say 'ah,'" and the child would attempt to imitate the sound. After these initial connections had been made, it was not necessary to pair additional motor and vocal imitations. The next step in the procedure involved teaching the child the basic vowel sounds, a, o, e, and combining these sounds into i, u, and consonant sounds. By proceeding with these simple sounds, it was possible to teach one child some fifteen words such as hi, go, car, away, O.K., and Susie. Training took about fifteen sessions.

While at this point I have only described procedures for building motor imitative skills and imitative vocalizations, the next step in the program, of course, is to teach the child to use vocalizations in a meaningful way. For example, if the child can imitate the word, "Hi," the next step is to teach the child to use that word when someone new appears. This procedure involves having the child imitate the word, "Hi," when the new person appears and fading the imitative cue. Instead of completely prompting the child

by saying, "Susie, say 'Hi,'" the therapist may just whisper the word, "Hi," and finally mouth the word as a partial prompt. Teaching the youngster the meaning of words can, of course, be even more complex. However, several investigators across the country have achieved success in doing so. Examples of such studies on imitation and speech may be found in the Journal of Applied Behavioral Analysis, in a paper by Lovaas (1966), as well as in a very excellent book edited by Sloane and MacAulay (1968) entitled, Operant Procedures in Remedial Speech and Language Training.

Since imitation is a technique which helps handicapped children increase the rate at which they can acquire new responses, it might be considered a basic behavioral technique. Such techniques can modify the development of the mentally handicapped to such an extent that they may someday approach that of normal children.

TOWARD A TECHNOLOGY OF EDUCATION

Robert F. Peterson, Ph.D.

If we ask what is the purpose of any educational system, the obvious answer is, "It is to teach certain skills and behaviors to members of a society." Rather than defining the skills and behaviors in general terms, such as understanding, or awareness, or knowledge, those in the behavior modification field try to delineate as specifically as possible the behaviors that need to be taught. Thus, to know that a child really understands the concept of milk, one might say that the child can tell you that milk comes from a cow, it's white, it costs forty-nine cents a half gallon in the store, it contains calcium, protein, fat, and so forth. To the degree that a child can make more and more meaningful statements about milk we might say he understands the concept of milk.

If we ask how effective our educational system has been in teaching specific skills, it is hard to be completely enthusiastic about the results. Many young adults who enter the university have yet to learn basic writing skills. In addition, we find high school students who do not read at an appropriate grade level. Ultimately, we can find college dropouts, high school dropouts, elementary school dropouts, and even the new phenomenon, the nursery school dropout. Thus, in many ways our current educational methods have not provided the necessary behaviors that are needed.

B. F. Skinner (1968) has pointed out that one of the reasons why the educational system may not be functioning nearly as effectively as it could may be related to the fact that the system does not use consequences for behavior as often or as specifically as it might. While students do receive credits, degrees, and promotions, oftentimes the child may display thousands of behaviors before receiving feedback on the correctness of his answers. In addition, it is often difficult to get students interested in educational materials. Many things compete with educational objectives such as sleeping in, talking with your friends, going to movies. The list is probably infinite. It is possible, however, to increase an individual's motivation to achieve through the application of reinforcing consequences. To illustrate, I would like to describe a couple of studies with organisms below the human level. Some time ago, Tom Verhave (1966) reported a study which he conducted while working for a pharmaceutical company. Verhave observed that drug capsules were inspected by a group of women. The ladies would toss out the bad capsules as they came by on a conveyer belt. Verhave thought it might be possible that other organisms could perform the same task. Therefore, he constructed a small apparatus where a drug capsule could be viewed through an open window by a pigeon. The pigeon was ultimately taught to strike a key whenever he observed a bad capsule. When the pigeon was correct he was reinforced by having access to food. When he made a mistake the apparatus shut down briefly. In a short period of time, Verhave was able to teach the pigeons to inspect the capsules and

be accurate over 90 per cent of the time. When he suggested this operation to the management of the company, however, they did not respond with enthusiasm. Management was concerned that there might be problems with labor unions and that such operations could hurt the company's public image.

Using a similar procedure, Cumming (1966) was able to teach pigeons to work for an electrical company. The pigeons learned to inspect a ceramic diode for cracks, bad paint, and malformations. The birds were able to inspect about 1,000 diodes per hour with an error rate that was lower than that of the human inspectors. The management of the electrical company, however, like that of the pharmaceutical company, was not ready to implement this procedure on a wide scale. In another study, Herrnstein and Loveland (1964) demonstrated that pigeons could look at slides of landscapes and quite accurately identify whether or not there was a human figure in the slide. The pigeons pecked a key whenever the slide contained a human form, whether it was a man, woman, or child, and dressed or positioned in a wide variety of circumstances.

These examples are put forth not because I think we ought to replace people with pigeons but simply to indicate that the potential of almost any organism may be vastly underestimated. Given certain kinds of incentives and the appropriate environment, all of us may be able to perform skills we have only dreamed about. Some years ago, Montrose Wolf and his colleagues at the University of Kansas reported a study (1968) on disadvantaged children which was designed to increase the children's academic skills. Wolf and his colleagues developed a special school that opened when the regular school day was over. There was no pressure to attend; attendance was voluntary. Points were given for completing work assignments correctly. The points could be exchanged for food, trips, clothing, in short, almost anything money would buy. Many of the children became so highly motivated that they would refuse to engage in any leisure activities. They asked to work during holidays, on weekends, and in the evening. Progress tests showed that because of the additional incentives and training, children in this project tended to increase their skills about twice as fast as children who were not in such a project.

It is probably true that some people might have qualms about putting children on such a point system. In effect, the children were being paid to learn. However, consider the alternatives. If these children do not learn, they are going to be unemployed. If they are unemployed, many of them are likely to be on welfare, others are likely to turn to a life of antisocial or criminal activities. There will be a social cost incurred in any of these activities It is likely that this cost would be higher than the cost of the incentives given them to learn appropriate academic behaviors. (In addition, it should be remembered that the incengives were faded out as the youngsters' skills increased.)

Thus, it would appear that one way that we may increase the effectiveness of our educational system is to re-evaluate the use

of consequences in the classroom. This evaluation would include considerations of material consequences as well as the natural reinforcers often used by the master teacher.

In addition to reinforcers, however, we must also look at how the child is taught. When a youngster is learning a set of materials, the material is oftentimes presented in a rather haphazard fashion. The basic concepts may move too rapidly for the child to readily grasp them. In other words, the steps between items may be too large. Programmed instruction is an alternative that needs to be carefully considered in this regard. Programmed instruction is based on the idea that any material can be broken down into a series of small steps such that a youngster can proceed through the material and make few, if any, errors. Thus, if a child is not learning, we can ask two questions: (1) Is there enough incentive, motivation, or reinforcement for him to engage in the task? and (2) Has the material been broken down into small enough steps so that he can readily grasp each aspect of it?

A word of caution is in order, however. While many sets of programmed materials have been published, few of them have been carefully tested in terms of whether a child can go through the program without making errors. Unless a program is carefully constructed and continuously evaluated, it may not be effective. Programs which are tested in such a way can provide increased understanding.

It is interesting to note how we usually react when a child is not doing well in school. Our first assumption is that there is something wrong with the child. Thus, we take him out of class and evaluate him through questions, attitude scales, personality tests, and intelligence tests. One alternative that is seldom considered, on the other hand, is that maybe there is nothing wrong with the child. The child's behavior could be perfectly appropriate, given the experiences he has had in his current environment. This alternative suggests that what we need to analyze is not the child per se, but the environment in which the child is performing. This includes the instructional materials, individual incentives, teacher's behaviors, as well as the behavior of other children in the class.

A short time ago Sidney Bijou, Marian Cox, and I published a study which involved two children who had not done well in their usual classroom situation (Peterson, Cox, and Bijou, 1970). The youngsters were named Jeff and Tim. Jeff was eight years old and was quite bright. Nevertheless, he refused to perform in his second grade classroom and was transferred to our remedial school. Jeff would get the other children to play during work periods, daydream, look out the window a lot, and do everything but the work that was assigned. The other boy, Tim, was six years old and was referred to this special class because a kindergarten teacher found his behavior objectionable. Tim had tantrums and would sometimes behave like a monster, walking around the room in a stiff posture, making low noises. Tim seldom attended to his work. Our goals with Jeff and Tim were to provide the best set of circumstances

we knew which might increase their motivation to study. In order to do this, the children sat together at a table with a single teacher. The teacher worked individually with one boy for half an hour, then with the other. We found that, depending upon how the teacher reacted to the boys when they were studying, they might engage in work from 85 to 100 per cent of the time or work at a very low level from 0 to 30 per cent of the time. When the teacher interacted with the boys regardless of whether they were studying, they worked very little. This was true both when the teacher spent a lot of time with a youngster or had the youngster work by himself. However, when the teacher dispensed praise and attention contingent on appropriate school work, the boys' rate remained quite high. These procedures were tested several times during the study and this relationship was maintained. Thus, we might say that the child's behavior was really a function of the teacher's behavior. There was nothing specifically wrong with these youngsters except that they were not receiving the appropriate kind of consequence for their behavior. In other words, we might say that if the child is not learning, the teacher is not teaching.

Unfortunately, we do not have enough teachers so that a single teacher can dispense all of her attention to only two children. Nevertheless, other investigators have shown that the way in which a teacher responds can be extremely critical and important in determining how the children will respond in large classes. In a recent study, Dr. Wesley Becker and his associates (Madsen, Becker, Thomas, Koser, and Plager, 1968) were asked to work with two teachers in a primary grade classroom of forty-eight children. The teachers complained that the children were much too noisy and were not making satisfactory progress in some of their activities. Also, the youngsters were frequently out of their seats and talked to each other when they were supposed to be working quietly. The psychologists sent two observers into this classroom and recorded the number of children standing up or talking to one another during any given ten second period. They also noted the number of times the teachers told the children to sit down during this time as well as the amount of praise the children received for working. Madsen et al., reported the following observations. The baseline condition was:

2.91 children standing per ten seconds (on the average)
6.8 commands to sit down per twenty minutes

Since it was possible that the children were simply not aware of the teachers' commands, the teachers increased the frequency of "sit down" commands to see if that would help the situation. The result was:

4.07 children standing per ten seconds
27.5 commands to sit down per twenty minutes

(It should be noted that an increase of one child per ten seconds amounts to sixty children per ten minutes or 360 children per hour.) To check the reliability of these relationships, the teachers

reduced the number of commands given. Under this second baseline condition the results were:

2.95 children standing per ten seconds
5.6 commands to sit down per twenty minutes

As an additional check, the teachers again increased their "sit down" commands. As a result they found:

3.86 children standing in the average ten second period
28.3 commands per twenty minutes to sit down

These results indicate that the more you tell a child to sit down, the more he tends to stand. This obviously was not what the teachers had intended, but the observations clearly demonstrated that this was what was happening. Next, the teachers began to ignore those children standing and to praise those who were seated. As a result, when the teachers gave 21.1 praise comments per twenty minutes, the number of children standing dropped to 1.89 per ten seconds. This same effect was found for the number of verbal interactions among the children. The more the teachers told the children to sit down and be quiet, the more the children spoke to each other. When they praised those who were quiet, the children worked silently.

Results such as these suggest that it is indeed possible to apply reinforcement techniques to large groups of children. While the amount of control exercised may not be quite as good as with smaller groups, nevertheless, these procedures can make an important difference.

Even so, it is difficult for a teacher to monitor the effects of her own behavior and at the same time teach the youngsters specific skills. If one is going to give each child additional attention, especially for certain kinds of behavior, it may be helpful to have assistance in the classroom. An important study in this regard was recently published by Robert Morgan and Thomas Toy (1970). Morgan and Toy selected a group of children ranging from the second grade to the fifth grade who were deficient in certain subject areas. The student teachers were drawn from the eighth to the twelfth grades. The older students assisted the younger students three days a week for twenty to forty minutes during free time periods. The older students were given no specific instructions other than to be warm, friendly, not to punish, and to consult with the classroom teacher about the students' progress. Morgan and Toy evaluated both the student teachers and their pupils at the end of a four month period. They found the younger students had gained five months in reading, over seven months in spelling, and over nine months in math. A control group of students who did not receive this type of training gained only two months in reading, two months in spelling, and a little over four months in math. Thus, the tutored students gained almost twice as much as the untutored students. Even more interesting, however, were the effects on the tutors over the same period of time. The tutors gained almost thirteen months in reading, nine months in spelling, and sixteen months

in math. A control group of tutors who did not engage in the actual tutoring gained only four months in reading, four months in spelling, and ten months in math. Thus, it would appear that not only can student teachers benefit younger students, they can also learn a great deal themselves by acting as a teacher.

Studies such as this one suggest that some people can be effective teachers even when they have not been professionally trained as such. The only qualitication may be that they have recently gone through this same educational experience themselves. Using students as teachers would allow students to give something back to the educational system. It would put them in a more active, participating role rather than being dependent recipients of the educational process. Such changes, however, would call for some reconsideration of our roles as professionals. We would have to learn to be more creative, more accepting, and less role-defined in our activities. As a result, we may find that the teacher's role could change in the direction of making truly creative contributions in curriculum as well as in motivating youngsters to become really interested in their own education.

BEHAVIOR PROBLEMS IN THE CLASSROOM

Linda Peterson, R.N., M.N.

I do not believe I have to point out just how important the classroom situation is to the socialization and the development of the child. Nevertheless, teachers and other professionals will sometimes complain that the problem a child displays in the classroom is not due totally to the classroom situation but really has its source in the child's home. Thus, some authorities will recommend that the basic cause of the child's problem must first be treated in the home before his classroom behavior can be expected to improve. In this regard Robert Wahler (1969), at the University of Tennessee, recently reported a study of a young child who displayed behavioral problems in the classroom and at home as well. This child yelled at a high frequency, refused to take naps, and to share toys. Wahler measured the amount of cooperative and deviant behavior in both home and school. He then disregarded the child's behavior in the classroom and attempted to work in the home, training the parents to deal with the child's behavior there. The parents were taught to use praise reinforcement for a task and cooperative behaviors as well as to isolate the child (time out) for a brief period following undesirable behaviors. As a result, the rate of cooperative behavior increased in the home. Interestingly, however, it did not change in the classroom. Even though the behavior of this eight year old child changed at home it did not carry over to the school. Wahler then had the parents stop using these procedures. As a result, the child's behavior became worse at home with little change in the school situation. Next, Dr. Wahler began to treat the problem in the classroom and had the teacher reinforce appropriate responses. Then behavior in the classroom improved. The parents were also told to reinstate their earlier procedures and found the behavior again improving at home. These findings suggest we should begin to look upon the notion that "you cannot do anything with the child in the school because the source of the behavior is in the home" with some skepticism. It seems possible that children can behave appropriately in one setting and not another, depending upon the conditions surrounding them in that particular setting. It is, of course, possible to try to work in both settings and integrate procedures. For example, a child who behaves particularly well in the classroom might be given a note to take home which would request that the parent add some additional reinforcers.

Sometimes teachers feel that it is not quite right to attempt to single out one child who is misbehaving and to give him specific reinforcers for appropriate behavior because this appears to be favoritism. They fear that the rest of the class may become jealous or unhappy. In addition, it is thought that the behavior of other children might also become uncooperative so that they can receive special attention. Dr. Vance Hall and his colleagues at the University of Kansas recently reported a study that suggests this may not necessarily be true. In this study the investigators (Braden, Bruce,

Mitchell, Carter, and Hall, 1970) measured the behaviors of two boys who were seated together in the classroom. Both children were somewhat disruptive. Observers measured the frequency of inappropriate behavior during specific times of the day as well as appropriate study behaviors. Next, the teacher introduced a reinforcement program for only one of the children, Ed. As a result, Ed's behavior improved. Interestingly, however, Craig, the other child, also improved even though only Ed was being reinforced. Subsequently, the teacher switched reinforcement from Ed to Craig. And while Ed's behavior declined slightly, Craig's behavior jumped to an all time high. In a reversal period, where the teacher attended to the boys when they were behaving inappropriately, all appropriate behaviors declined. Subsequently, the teacher returned to reinforcing both boys for appropriate study behaviors. This experiment suggests that, at least in this situation. it was possible to reinforce a single child and see a positive change in the behavior of a second child. These benefits may occur simply because one child is now providing few inappropriate behaviors to which the other child can respond or because the teacher is in close proximity to both children when one is behaving appropriately.

Obviously, peers have a strong influence over the behavior of other youngsters in the classroom. Peer reinforcement may be more effective than praise and attention from the teachers in some cases. Peer reinforcement can, therefore, be employed to reduce disruption if, for example, contingencies are arranged so that when a single child (who exhibits a problem behavior) behaves cooperatively, this allows all the children in the class to earn points toward some desired class activity. When such arrangements are made it is in the other children's interest to see that a problem child behaves more appropriately. A variation in this procedure involves informing the class that when a kitchen timer goes off, provided every child is in his seat, the whole class will receive a reward. If the reward is highly desirable to the group, we might find that the children work to keep the other children in their seats. It may also help if the deviant child can sometimes give out rewards or reinforcers to other members of the class. If the reward is contingent on his appropriate behavior it will increase those responses and also help him to develop better relationships with his peers.

Lloyd Homme and his associates have written a very useful book called Contingency Contracting and the Classroom (1969). Homme and his colleagues suggest that we organize the classroom in such a way that after a child has displayed a certain amount of appropriate work behavior, the child is allowed to choose some kind of reinforcing activity and engage in that activity for a period of time. A brief quote from Homme will give you an idea of the procedure as well as the interesting way in which this book is written

> The amount of control exercised on the first day can be summarized: none. One child was running and screaming, another was pushing a chair across the floor, rather a noisy

chair, and the other was playing with a jigsaw puzzle. Once our scholars discriminated that punishment did not follow these activities (the rate at which this discrimination was made must have set a new indoor record), their response to the verbal instruction "come and sit down now," was to continue the running, screaming, chair pushing, and so forth.

Homme goes on to describe how he used the Premack Principle, which involves making a high frequency behavior contingent upon a low frequency behavior.

We made the involvement in these behaviors (running, screaming, chair pushing) a small amount--very small at first--of whatever we wanted them to do. A typical early contingency was merely for them to sit quietly in chairs and look at the blackboard. This was followed almost immediately by the command,"Everyone run and scream, now." This kind of contingency management put us in immediate control of the situation. We were in control to the extent that we were able to teach everything in about one month that we could discover was ordinarily taught in the first grade.

Contracting describes the use of many behavioral techniques and is especially interesting in that it suggests how children can be taught to organize their own tasks, select their own reinforcers, and reinforce themselves for accomplishing a certain amount of work. The book also suggests how one can move from a one-teacher managed program to a student-managed program. Thus, these programs may be helpful in teaching a youngster self-direction and self-control.

One problem that occasionally crops up in the classroom concerns the youngster who is always prompting other children. Sometimes it may be caused by a bright youngster who knows the answer and simply cannot contain himself. Hall (1970) reports a study where a teacher recorded the number of times a child had an opportunity to prompt other children and the number of times he actually did prompt them. She then told the class that "If nobody prompts today or if you can keep the prompts at a low level, candy will be dispensed." As a result, the child who frequently prompted reduced his prompting. The teacher then went back to telling the class that the children who were quickest to come out with the answer were going to get candy. As a result, prompting increased. Then, she told them that those children who did not blurt out answers would receive a piece of candy and the child's prompting behavior decreased. While these procedures were specific to prompting they can, of course, be used for many kinds of classroom behavior. Consider, for example, the child who dawdles, or who takes a long time to get into an activity. In this case, one might consider reinforcing certain approximations, such as "I like the way you're getting out your pencil" or, "I like the way you're opening your book." As these behaviors become strengthened,

more behavior should be expected before reinforcement is given.

One of the most difficult things for all of us to do is to increase the rate of reinforcement that we give to other people. Phillips (1970) has noted that it may initially be necessary to reinforce some children as often as every thirty seconds to "set off" behavioral change. To do this the classroom might be structured so that the teacher does not always have to be seated at her desk but is free to walk up and down the aisles praising the children who are working productively. In some instances, teachers may want to have each child place a card on his desk which the teacher can mark when he is working appropriately. Even so it is sometimes so hard to get a teacher to praise children at a high frequency that she may say, "It feels superficial or phony." It sometimes helps to have the teacher select those kinds of praise statements which feel most comfortable to her. One might also utilize a second person in the classroom who can signal the teacher when a child is working appropriately by pointing or by standing behind the child. Ultimately, the second person should fade out her participation so the teacher can reinforce the children without assistance. Most teachers find that, with a little practice, reinforcement becomes a "habit" that is a lot more "fun" than nagging. When teachers have no "signaling person," it is helpful to set up a kitchen timer so that when it goes off, the teacher is reminded to reinforce at that moment.

When we consider the school environment it is obvious that many more persons than the teacher have responsibility for child management. It is noteworthy, for example, that when a child misbehaves in the classroom, he is frequently sent to the social worker's or principal's office. From our foregoing discussion it is obvious that we need to measure the effects of such contingencies in relation to the frequency of the child's responses. In many cases it is possible that this "trip to the office" provides more attention than the child gets when he behaves appropriately in class. One might ask what would be the effect if the principal or social worker were to request that the child come to see him contingent upon appropriate kinds of behavior! Vance Hall (1970) has reported the innovative approach of a principal who was concerned about the high noise level in the halls at dismissal time from school. The principal tape-recorded the noise and informed the students that on days they lowered the noise, they would be dismissed five minutes earlier from school. At the end of a week, students were tiptoeing out of the building!

All these examples bring us to the old adage: "Accentuate the positive"--but in a systematic way such that the positive is planned to benefit both child and teacher.

ADMINISTERING BEHAVIORAL PROGRAMS

Linda Peterson, R.N.,M.N.

When considering the administration of any behavioral program, we must first decide what the goals are for both staff and patients. We need to specify the behaviors of the staff as well as the patients. It is important, of course, to try to specify these in as much detail for each individual as possible. Next, we need to determine baseline measurements for the students; in other words, what behaviors they are currently displaying. Bensberg (1965), for example, provides a useful check list in his book, Teaching the Mentally Retarded a Positive Approach, which will help evaluate individual youngsters with regard to personal hygiene, self-help skills, academic skills, and social interaction. By specifying behavior to be developed, both staff and residents will know our expectations and be less confused about what is required of them. It is also important to observe behavior of staff and assess their skill levels. In many cases, people may have a verbal understanding of reinforcement principles and their operation, but they are unable to translate their understanding into effective practice. As an administrator, one can go into the situation, observe the behavior of the staff member (it is helpful if the staff member is aware of this beforehand and agrees to it), and then reinforce those interactions on the part of the staff that seem to be especially therapeutic. Gardner (1969) has developed a helpful check list of behavioral skills which can be used for assessing staff. A test to determine a staff member's "head knowledge" of principles can be found in the book, Child Management, by Smith and Smith (1966).

After assessing staff and child baseline skills,we next need to consider the present reinforcement system for the youngsters. Almost anything that one sees a youngster do or play with might be used as a reinforcer. This should suggest many different kinds of reinforcers to you. Homme, in his book on contingency contracting (1969), gives many examples of reinforcers for young children. It is important, however, in indicating contingencies to children to put them in a positive rather than a negative way. For example, do not say, "Unless you do such and such, you won't get to go to the movies." Put it the other way around, saying, "When you have finished such and such, you may go to the movies."

It is also important to determine who is going to be involved in a specific behavioral program; that is, who is going to participate and support it in order to make it effective. Second, gain the cooperation of the team (auxiliary personnel). Finally, it is important to determine what kind of data will be taken and how it will be displayed. In some instances, it may be helpful to have the children keep their own records. Records should be placed where all can view them. As an example of going through some of these steps, I would like to describe a study initiated by a nurse, Mrs. Edith Watson, and a psychologist, Dr. Allen Weisen (1967).

Watson and Weisen were aware that behavior modification was well known in their institution but felt it needed to be "sold by demonstration" on a unit which contained some forty children. Dr. Weisen and Mrs. Watson started by asking the staff, "If you had a choice, which child's behavior would you most like to change?" Very quickly the staff described a little boy named Pete who was extremely hyperactive and destructive. He slept for short periods at night and was particularly skilled at disturbing staff members. He would untie shoe laces and aprons, unzip zippers, unbutton buttons, reach into pockets, pull on clothing, and sometimes lick, bite, or hit the staff. In addition, he sometimes soiled his pants, smeared feces, ate feces, took his clothes off, and threw dirty pants around.

When Mrs. Watson and Dr. Weisen asked the staff, "What do you usually do in response to Pete's behaviors?" they said, "Oh, we ignore him." So Watson and Weisen went in and began to observe. It was true that the staff was fairly good at ignoring these behaviors. But, in some instances, Pete's behaviors would become so irritating that the staff could not ignore him. They had to tell him to "stop it" or interact with him in some way. At this point Pete would grin! It could be seen that his behavior was receiving a certain amount of intermittent attention. Such intermittent reinforcement produces a very resistant behavior. Further observations of Pete indicated that he interacted infrequently with children. He was almost entirely adult-oriented. Thus, it appeared that the adult contact might be a good reinforcer. In turn, the removal of adult contact might be a negative reinforcer for Pete. Subsequently, one staff member sampled twenty-minute periods in the morning and the afternoon to count the base rate of Pete's objectionable behaviors. These samples revealed that Pete had as many as 120 inappropriate responses in a twenty-minute period. After measuring the baseline of these behaviors, procedures were set up so that any time Pete attempted to make inappropriate contact with adults, the attendant told him to stop. If he did not stop he was taken to a time out area. In this case, the time out area was a patio outside of the main building. Pete was required to stay there for five minutes, and then if he was quiet for a brief period, he was allowed to re-enter the day room. If he defecated or smeared feces while outside, the time out period was extended an additional six minutes. When this happened he was not immediately bathed or cleaned up for five more minutes in order to avoid immediately reinforcing undesirable smearing responses. In addition, whenever Pete began to look at, touch, share toys, or interact with other children, staff would go to him, tell him he was a good boy, and give him some candy. It was hoped that by focusing on reinforcing a behavior involving other children Pete would decrease his adult-oriented responses.

Before starting the program a staff meeting was held for both aides and supervisors. Questions were encouraged. Some of the staff were not convinced that this procedure would be effective. Some were worried that if he took his clothes off, he might catch cold,

while others were worried that he might eat feces and get sick. But other aides revealed that the child had taken his clothing off on the unit, that it was not cold outside, and that he had not ever caught cold. In addition, Pete had been eating feces for many years and had not become sick. Thus, it was concluded that the program might be likened to a surgical procedure. It may cause a little initial discomfort for everyone, including Pete, but, in the long run, all would benefit. The program, however, had to be carried out by every adult who worked on the unit. It was not a program that a single professional could direct and implement from an office desk. Weisen and Watson came to the unit and helped the staff carry out the procedure. During the initial part of the program, Pete went into time-out forty three times in twenty-four hours. He had five episodes of soiling, smearing, and eating feces. Things were obviously getting worse before they got better. This is not unusual. Children will test contingencies to the hilt before submitting to them. In a week, however, Pete's objectionable behavior had dropped from 120 in twenty minutes to only six in twenty minutes. Defecation had dropped from five times a day to one every other day. Several additions were made in the program while it was in effect. Pete seldom interacted with other children. Thus, the program was re-designed so that other children could reinforce Pete. Candies were given to them so that they could give them back to Pete. It was hoped that, ultimately, child relationships could be built as Pete began to associate other children with reinforcement. At one point, when Pete was placed in time out, he refused to come in from the patio. A staff meeting was held, and it was decided that if Pete refused to come in from time out, the staff would simply add an additional time out requirement (two minutes). This additional period soon taught Pete to come in at the earliest possible moment. In about two weeks Pete's disruptive behavior was almost completely eliminated. The staff now had more time for other children and had learned the importance of consistency in administering a behavioral program. It became obvious, however, that it was easier for the staff to use time out than to remember to reinforce appropriate behavior. It is often necessary to prompt staff to use more reinforcers in a variety of ways. Carrying timers and putting up written notes, such as "Reinforce good behavior like crazy," is often effective.

It might be pointed out that when we do use reinforcement, we should attempt to personalize it. Some years ago, in observing an elementary classroom, a teacher was saying, "You are <u>all</u> doing very well. I really like the way you are listening." One little boy in the back of the room said, "Teacher, name us." Reinforcement may be more effective when it is personalized. Punishment on the other hand should be depersonalized. It is helpful to say to a child, "It is the rule that we do such and such," not "I say you must do such and such."

It may be helpful in the administration of programs to see that the staff overlap working hours so that training and supervisory staff work with both the morning staff and evening staff.

In some settings a trained behavioral supervisor works 9:00 to 5:00, while staff works 7:00 to 3:00 and 3:00 to 11:00. The behavioral supervisor needs to "show how" to do things not to "tell the staff what to do." This will also help avoid problems such as accusing one shift of not doing their job.

Dr. Peterson mentioned earlier that sometimes we don't have enough staff to carry out behavioral programs. I think it is exciting that there are newer developments in which residents and students are involved as behavior modifiers for other residents and students. A couple of years ago Dr. Henkel at U.C.L.A. (1967) reported a study where retarded children were used to teach other retarded children certain verbal skills. Earlier we mentioned the use of older elementary students to help teach younger elementary school students. These developments need to be encouraged and further investigated. It is important that administrators do more than just hear about specific problems. They need to observe the situations in question as one can make better suggestions as a result of this kind of information. It is also helpful if authority is shared. One professional or one staff member should have the same kind of authority as another insofar as the children are concerned. It is important that the staff have a "united front" and give the same reinforcement or "ignoring" for specified child behaviors.

Some years ago we had a situation where a psychiatrist would get an idea, and would come in and attempt to interact with a child differently than the program specified. As a result, the staff began to sabotage his work. They frequently would say to the children, "You have to go to bed because Dr. So and So says so," or "You cannot do that because Dr. So and So doesn't want you to." Subsequently, one little boy observed the psychiatrist come in, took his shoe off and threw it at him. After that everyone began to work as a team, sharing roles and authority!

One of the areas which needs particular attention by a supervisor is the reinforcing of those staff members who are under his supervision. Sometimes it is helpful to ask yourself, "When do I see my staff in my office?" If the answer is "When they have done something wrong," then we need to make amends! Reinforcement is most effective when it is given to staff contingently--while they are actually working with patients appropriately. "I like the way you reinforced (or ignored)," is much more helpful than generalized praise such as "You are doing a good job."

Staff behavior seems to improve more readily when expected behavior is spelled out and evaluative feedback is frequent--at least every month. Staff conferences on patient programming need to be held even more often--at least weekly. Such conferences can provide opportunities for supervisors to reinforce appropriate planning or task analysis by staff. Finally we ought to look for all possible staff reinforcers. Filming staff members working with patients might be reinforcing to some staff members; the opportunity

to work in certain shifts and to vacation at desired times might be reinforcing to others. It follows that salary increase, contingent upon especially fine performance, might also be considered. People seem to respond best when one focuses on their strengths and approximations toward desired behavior rather than focusing on their weaknesses. The timing of our attention as supervisors may well function to increase or decrease staff behavior, just as the timing of our attention functions to influence what kinds of behavior we see in patients.

MODIFICATION OF SELF-DESTRUCTIVE BEHAVIOR

Robert F. Peterson, Ph.D.

Self-destructive behavior is one of the most severe problems a retarded child may display. Such children may slap themselves or bang their heads against objects until they become blind or cause tissue damage. It has been estimated that roughly 10 to 15 per cent of all institutionalized retarded children engage in self-injurious behavior.

Several explanations have been put forth as to why children display self-injurious behavior. Some investigators suggest that the self-destructive child may feel guilty and is trying to punish himself. Others have suggested that the self-injurious child is trying to establish a body image. In addition, it has been put forth that self-injurious behavior might contain an erotic component and may be pleasurable in some sense. It has also been hypothesized that the self-destructive child may be attempting to provide himself with stimulation which is lacking in his current environment. While these explanations may suggest ways of thinking about the origin of self-injurious behavior, unfortunately, they do not tell us how to deal with the problem.

One treatment which has been used successfully with self-injurious youngsters involves the application of strong aversive stimuli, such as electric shock, following each incident of self-destructive behavior. While this procedure has been successful in decreasing self-destructive behaviors, oftentimes the effects of such procedures are limited. The child may stop only in the presence of the person applying the punishment or the situation in which the punishment was received. For these and other reasons, some five years ago, Mrs. Peterson and I attempted to investigate whether or not there might be a method involving positive reinforcement that could be used to reduce the frequency of self-injurious behavior in a retarded child (Peterson and Peterson, 1968).

The subject of our study was a boy named Mark. Mark was eight years old and had been a resident of an institution for the mentally retarded since the age of six. Mark was not toilet trained and did not talk but was ambulatory and would respond to a few simple commands. According to Mark's medical records, he suffered from mental retardation of an unknown etiology. Mark spent most of his time sitting on a bed, covered with a blanket. If one took the blanket from him, he would engage in violent self-injurious behavior, striking himself about the face or head with his hands. At other times he would bang his head against objects or walls, often when brought to meals or when required to participate in his own self-care.

Initially, Mark's self-injurious behaviors were recorded on the ward where he slept and in a small room which was used for treatment. Mark was taken into the room at mealtimes and seated

at a table in front of the therapist. If Mark did not strike himself for a period of three to five seconds, he was told he was a good boy and given a small bit of food. If he did hit himself, the therapist took the tray, turned away, counted silently for a few seconds, and if no more injurious behavior had occurred, turned back and again reinforced him with food. This procedure continued for some ten sessions. During this time, Mark's self-injurious behavior varied considerably but on the average decreased about 50 per cent.

After ten sessions, an additional procedure was added. Mark was still reinforced when he did not hit himself, but instead of turning away with the food when he struck himself, the therapist taught Mark that whenever he struck himself, he must get up, walk across the room, and sit in a chair. If he struck himself as he walked across the room, he was told as soon as he sat down that he had to get up and walk back to the other side of the room. This procedure continued until Mark had covered the distance from one side of the room to the other without engaging in self-injurious behavior. When this occurred, the therapist moved to Mark and told him he was good and continued to reinforce with food. While Mark's behavior varied considerably during this time, self-injurious behavior began to decrease until it reached a point where Mark would spend about fifteen minutes in the room without striking or hurting himself.

Since these procedures had not been tried before, it was necessary to test whether they were really responsible for the reduction in Mark's self-destructive behavior. Thus, the procedures were reversed for a brief period of time. For three sessions Mark was fed when he struck himself and told to walk across the room when he did not hit himself. As a result of this change, Mark's self-injurious behavior began to increase, and it became obvious that the procedures were important in producing and eliminating self-destructive behavior. Subsequently, the earlier procedures were reintroduced; Mark was now fed when he did not hit and instructed to walk across the room when he did. Self-injurious behavior again dropped to a very low level.

In addition to the procedures just described, Mark was also taught some other ways of controlling his environment. Since Mark did not speak, he was taught that whenever he wanted a particular kind of food, he was to point to it.

Mark seldom, if ever, showed any positive emotional behavior, such as laughing or smiling before the onset of these treatment procedures. However, we noted that after the self-destructive behavior had been reduced to a low level, Mark began to smile at us whenever we approached him to take him to the treatment sessions.

Following the termination of the treatment procedures, Mark's self-injurious behavior was still present in other settings. The staff of the institution reported that destructive behavior seemed to occur less often and that Mark now spent more time observing

other children.

Subsequent checks on the status of Mark's behavior revealed a decline in self-injurious behavior after the termination of this study. Within several months the behavior disappeared in all settings.

While it is clear that the procedures employed were effective in reducing Mark's self-injurious behavior, it was not clear whether these procedures would work with other destructive children. Recently, Mr. Tom Heads, a graduate student at the University of Illinois, has employed similar techniques with a second severely retarded, self-destructive child. His study shows that such procedures can reduce self-injurious behavior in both ward and treatment settings. Thus, it appears that the technique may have some generality for the treatment of self-injurious behavior.

It should be pointed out that the self-injurious child may use this behavior to control his environment. We noted that by becoming self-destructive Mark was often able to get people to grab his hands, or even leave him alone. This seems especially important in that Mark had few other ways of influencing his environment. Thus, additional treatment procedures should probably involve expanding Mark's communication skills so that other kinds of behaviors may become more effective and useful.

EPILOGUE

It was my privilege to direct the planning and proceedings of this Special Study Institute. Due to unforseen personal circumstances, I did not have the opportunity to greet you or to enjoy the content of the conference.

I do wish to express my personal gratitude to those who "manned the ship" in my absence: Mrs. Dorothy Buehring, M.A., Associate in Education of the Mentally Retarded; Tony Zenner, who substituted for me at the opening of the Institute; and my secretary, Mrs. Doris Dwyer, who extended her energies "above and beyond the call of duty."

The Institute was a great success. The calls and casual comments of those who attended are strong and vocal testimony to this.

Again let me express my deepest appreciation to those who sponsored and participated, those who helped, and particularly to the Petersons--Dr. and Mrs. Robert F.--who were responsible for this innovative program and its contribution to our profession.

Edith Romano Regensburger, Ph.D.
Director of the Institute

FILMS

Teaching the Mentally Retarded: A Positive Approach
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Operation Behavior Modification
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Reinforcement Therapy
Smith, Klein, and French
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The Poppe Project
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Rewards and Reinforcement in Learning
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